

August 30, 2004

Mr. Ben Baker
Project Manager
The Dow Chemical Company
47 Building
Midland, MI 48674

SUBJECT: REQUEST FOR ADDITIONAL INFORMATION ON REVISION 1 OF THE
REVISED SUPPLEMENT TO THE DECOMMISSIONING PLAN FOR TDCC
BAY CITY SITE, MI

Dear Mr. Baker:

I am responding to The Dow Chemical Company's (TDCC's) letter dated December 8, 2003, in which you requested that the U.S. Nuclear Regulatory Commission (NRC) staff review and approve Revision 1 of the Supplement to the previously approved Decommissioning Plan (DP) for License STB-527. You also included a response to NRC's request for additional information (RAI) dated December 26, 2002, regarding Revision 0 of the Supplement to the DP. During our technical review of Revision 0, some omissions and deficiencies were identified. In your March 17, 2003, and June 3, 2003, responses to our December 26, 2002, RAIs and in Revision 1 of the Supplement, many of those deficiencies were addressed. Based on our technical review of Revision 1 and your responses to the previous RAIs, we agree with the conceptual approach as described in Revision 1 for characterization, surveying, sampling, excavating, and conducting final status surveys. However, we do have questions regarding Revision 1 that require additional information and clarification (see enclosure).

During our preliminary review of the sample data from the 750 borehole samples, we considered that the dose to the most likely receptor exposed within the remaining 9.1 acres might be less than 25 mrem per year without further remediation. Therefore, we are reminding you of other options, since it may be beneficial for you to consider using a dose based criteria based on realistic scenarios for releasing the remaining 9.1 acres for unrestricted use.

Please provide responses to the enclosed request for additional information (RAI) within 45 days of the date of this letter. If you prefer to meet with the NRC staff to discuss the RAI, a

B. Baker

- 2 -

meeting can be arranged. Following receipt of the responses to the RAI, we will continue our evaluation of your amendment request.

If you have any questions concerning this letter, please contact me at (301) 415-6626.

Sincerely,

/RA/

David Nelson, Project Manager
Decommissioning Directorate
Division of Waste Management
and Environmental Protection
Office of Nuclear Material Safety
and Safeguards

cc: Timothy Bertram, MDEQ
Dow Distribution List

Docket No.: 040-00017
License No.: STB-527

Enclosure: Request for Additional Information

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Enclosure: Request for Additional Information

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**REQUEST FOR ADDITIONAL INFORMATION NEEDED TO SUPPORT
REVISION 1 OF THE SUPPLEMENT TO THE DECOMMISSIONING PLAN
FOR THE DOW CHEMICAL COMPANY'S BAY CITY, MICHIGAN, SITE**

August 2004

1. Section 3, Unrestricted Use Criteria, and Section 4, Final Status Survey - The cover letter to Revision 1 of the Supplement states, in part, that the Supplement "contains a survey and averaging approach that appears to be consistent with NRC approved guidance (the AAR Method) that was specifically developed to address sites with random subsurface contamination." In Sections 3 and 4 of Revision 1, you describe, in detail, how the AAR Method would be applied to the Dow Chemical Company (TDCC) site. Specifically, you describe a survey and sample collection methodology to be used and include acceptance criteria used to evaluate the data collected. The NRC staff agrees that the statistical approach used by the AAR Method appears to be valid.

We note, however, that the release criteria in Revision 1 appear to be 5 pCi/g for Th-232 and 10 pCi/g for total thorium (Th-232 and Th-228). You have not requested that the thorium concentration criteria be changed for the 9.1 acres remaining to be remediated. Therefore, compliance with the criteria for the 9.1 acres (2.9 pCi/g for Th-232 (average) or 3.2 pCi/g including background), which was previously approved under License Amendment No. 7, must be demonstrated.

Please address this apparent conflict. Either derive site-specific criteria for addressing surface and subsurface (unsaturated and saturated zone) residual radioactivity that are consistent with the 2.9 pCi/g criterion, or describe in detail why the criteria listed in Revision 1 on pages 20, 21, and 22 are appropriate.

2. Section 4.2, Unsaturated Zone - On page 22 you state, in part, that "investigation will be conducted and remediation completed, as necessary, if exposure rate measurements cause a subgrid to fail or if a borehole sample causes a subgrid to fail." You did not, however, describe the kind of investigations that will be conducted, circumstances for which remediation would be necessary, or the methods used to remediate the subgrid. Please provide a more comprehensive description of the investigation that would be conducted and describe how those failures would affect other decisions or remediation activities if failures are identified.
3. Enclosure 2 of Revision 1, page 13, paragraph 2 - In paragraph 2 you state, in part, that "the water table is at ground surface elevation over the entire site at certain times of the year." During those times there would not be an unsaturated zone, since the 9.1 acres would be under water. Given this condition, surveys could not be conducted during this time and unsaturated zone samples could not be collected in those areas of the site that are inundated. This would invalidate the AAR Method for determining subsurface residual radioactivity within the 9.1 acres. At other times of the year the water table is below ground, and there exists definable unsaturated and saturated subsurface zones. Depending on the depth of the unsaturated zone during the dry times, surveys could be conducted and sufficient samples could be collected to validate the AAR Method. Since the depth of the unsaturated zone is critical during surveying and sampling, please

Enclosure

describe the schedule that you will follow to ensure that surveying and sampling are conducted to properly characterize the surface and subsurface distribution of the thorium contamination within the 9.1 acres. Since the depth of the unsaturated zone is also critical to the proposed remediation approach, please describe the method(s) you will use to ensure that sufficient remediation (i.e., excavation) will be performed. Please include consideration of how the proposed additional surveying, sampling, and excavation will be consistent with the characterization data obtained to date.

4. Section 1.1.3, Current Site Condition, page 5 - In this section you state, in part, that "under the conditions of the permits (MDEQ and Corps of Engineers) excavated areas shall be graded and allowed to revert back into wetlands and will be left undisturbed." In Section 4, however, you indicate that excavated unsaturated zone overburden will be used as backfill to fill saturation zone excavations. There appears to be potential inconsistencies between your plans for excavation and the provisions of the permits. Please clarify your intent with regard to complying with the permits, as well as Revision 1 of the Supplement.
5. Section 4, Saturated Zone - In this section you state, "the affected area will be defined a priori by borehole samples collected in a square and circular pattern around the elevated location before the excavation begins. The linear distance between samples will vary depending on the size of the affected area but in no case will exceed 5 meters." Without further information, this statement implies that only one borehole sample collected adjacent to the original borehole would be sufficient to determine the size of the affected area's excavation. This does not appear to be the intent of TDCC. Provide clarification with regard to locations and numbers of samples collected.
6. Section 3.1, Unrestricted Use Criteria for Material in Saturated Zone - In this section you state, "after the presumed remediation of all identified areas exceeding 30 pCi/g Th-232 to 3.2 pCi/g, the average concentration of licensed material in the saturated zone would be 1.6 pCi/g Th-232." The meaning of this sentence is unclear. Specifically, is 30 pCi/g to 3.2 pCi/g the distribution of the Th-232 activity within the excavated material or, will the areas containing 30 pCi/g be remediated to 3.2 pCi/g and that value added to the other sample results to derive an overall saturated zone average of 1.6 pCi/g? Please clarify what is meant in the above statement or provide an alternate explanation for the use of 3.2 pCi/g.
7. Section 4.2, Unsaturated Zone - The second paragraph on page 21 states, "If a more realistic method is needed, additional, equally spaced, FSS borehole samples may be collected to determine a more representative concentration for the excavated sidewalls and floor at the discretion of TDCC. These additional samples would be random start, systematic samples at a frequency determined on a case-by-case basis." This paragraph implies that the AAR Method may not be sufficient to quantify the thorium activity levels in the saturated zone. Provide additional information that indicates when additional samples would be needed and/or how those samples would be collected. The purpose for including this paragraph in Revision 1 of the Supplemental needs to be clarified or the paragraph needs to be modified or deleted. If more samples are needed, provide the reason for collecting more samples in the context of using the AAR Method. Clearly identify the regimen that will be used for collecting the samples, and describe how the data will be used.

8. Section 3.3, Unrestricted Use Criteria for Groundwater in Saturated Zone - In the first paragraph of this section you state, "compliance will be demonstrated using the spatial average from the wells designed in the TDCC groundwater monitoring plan (to be submitted at a later date)." Submit the monitoring plan with your responses to the RAIs.
9. Incomplete Sampling - Revision 1 of the Supplement indicates that the ~750 boreholes will provide sufficient characterization and final status survey (FSS) sampling for the saturated zone. However, we note that some of the subgrids (100 m² areas) have not yet been sampled. For example, samples apparently have not been taken in subgrids E8-7, E8-8, E8-9, E9-7, E9-8, and E9-9. This situation also may be applicable to the unsaturated zone characterization. Describe how the characterization and FSS surveys will be completed for these and all subgrids of the 9.1 acre area (for both the unsaturated and saturated zones).